



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,419	11/26/2003	Heinz Eisenschmid	10191/3461	2637
26646	7590	06/16/2005	EXAMINER	
KENYON & KENYON ONE BROADWAY NEW YORK, NY 10004			PRUCHNIC, STANLEY J.	
			ART UNIT	PAPER NUMBER
			2859	

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/723,419	EISENSCHMID ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Stanley J. Pruchnic, Jr.	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Response to Arguments*

2. Applicant's arguments with respect to claims 1, 2 and 3-13 have been considered but are moot in view of the new ground(s) of rejection.

3. Applicant's arguments, see Remarks filed 14 March 2005, with respect to the rejection(s) of Claims 1-4 and 10 under 35 U.S.C. 102(b) as being anticipated by **SHIRAISHI** (U. S. Patent No. 6,071,081) have been fully considered and are persuasive as applied to the amended claims. Examiner agrees that **SHIRAISHI** has no technical feature useable for measuring a temperature, with no current measuring unit disclosed or fairly suggested. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of previously cited art.

4. Applicant's arguments, see Remarks filed 14 March 2005, with respect to the rejection(s) of claim(s) under 35 U.S.C. 102(b) as being anticipated by **MANDROIAN** (U. S. Patent No. 3,898,017) and also **MILLS** (U. S. Patent No. 5,814,721) have been fully considered and are persuasive as applied to the amended claims. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of previously cited art.

### *Claim Objections*

5. Claims 1, 4 and 5 are FINALLY objected to because of the following informalities:
  - a. In Claim 1, in Line 6, perhaps the word "a" before "**chamber**" should be deleted and replaced therefor by the word ~~--the--~~ in order to more clearly describe the invention.

Art Unit: 2859

- b. In each of Claims 4 and 5, the claim is objected to as depending upon a canceled claim. In each case, the claim has been considered to depend from claim 1.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-2 and 4-13 are FINALLY rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Pat. No. 5,375,979 A (TRAH; Hans-Peter) in view of U. S. Pat. No. 4,781,469 A (TURON-LAGOT; Gilbert).

TRAH disclosed a thermal micropump (Fig. 1) for pumping a fluid (Col. 1, Line 38) including:

- a **chamber 1** formed by a silicon substrate (4) and a glass "carrier" (7) (referred to by TRAH as a "carrier (7)", and which is also considered by the Examiner to be a "substrate" as claimed by Applicant in Claim 1 -- the substrate and carrier, one of which is considered a "cover", together cooperating to form **the working chamber (1) of the thermal pump**, which also is shown to include valves (2,3).
  - Further regarding **the chamber**: the chamber of TRAH has an inlet (2) and an outlet (3) which are situated in one of the substrate and the cover, as claimed by Applicant in **Claim 6**.
  - Further regarding the materials of **the chamber**: the substrate of TRAH is composed of silicon as claimed by Applicant in **Claim 6**; Alternatively, as described above, the cover of TRAH is composed of silicon as claimed by Applicant in **Claim 7**. Similarly, as described above, each of the substrate

and cover are composed of at least a semiconductor (silicon) as claimed by Applicant in **Claim 5**.

- an **electrical heating element** (6), **situated in the fluid** (Fig. 1) **and situated in the same chamber (1) described above** (through which the fluid is pumped, between the valves 2, 3).
  - Further, the **heating element** (6) is disclosed by TRAH as **acting [functioning] as an actuator** (Col. 2, Line 21 - Col. 3, Line 17) of the micropump, that is by causing the fluid to be heated and thereby to expand and be expelled out through a discharge valve 3.
  - Moreover, regarding the **heating element**: TRAH disclosed preferably "mounting the heating element on [the] carrier. And also disclosed the heating element could be applied according to a thin film technique ("deposited metallic layers"; e.g., Col. 2, Line 36) as claimed by Applicant in Claim 1, but the method of making the device, *i.e.*, "product by process", can't serve to distinguish against a device that has the same structure as claimed by Applicant.
- Further, the **device** is disclosed by TRAH having a multilayer construction, as claimed by Applicant in **Claim 10**.
- Further, the **heating element** (6) is disclosed by TRAH as being a resistor element (situated in the chamber, as described above), but TRAH does not explicitly describe the heating element to comprise **a PTC resistor element** as claimed by Applicant in **Claim 9**, and TRAH does not explicitly describe the heating element as having been produced from one of **aluminum** and **platinum**, and **coated with a dielectric** as claimed by Applicant in **Claim 8**.
- TRAH further discloses that the device requires, in order to operate as a pump, upon closing of the discharge valve, decreasing the temperature of the heating element (Col. 1, Lines 43-49) in order to cause a decrease in the fluid pressure in the chamber and thereby cause the intake valve (2) to open, to begin a next

Art Unit: 2859

pumping cycle. Moreover, TRAH discloses the heating element is "switched off" (Col. 3, Lines 1-4). Therefore TRAH inherently requires a means for controlling the temperature of the heating element. TRAH also discloses electrical contacts with the heating elements.

TRAH does not explicitly describe a current measuring unit to infer an instantaneous electrical resistance of the heating element as claimed by Applicant in Claim 1.

TRAH discloses or suggests a device as claimed by Applicant in Claims 1, 2 and 4-10, as described above, comprising an electrical heating element situated in a fluid, the electrical heating element acting as an actuator of a micropump and being situated in a chamber thereof, wherein according to a thin film technique, the heating element is applied to a substrate which is provided with a cover to form a chamber (in the device of TRAN, the same chamber).

With respect to the intended use of the apparatus, *i.e.*, for determining a boiling point of a hydraulic fluid of a hydraulic system: It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Furthermore, the intended use is recited in the preamble. The functional limitations recited in the preamble which have structural implications have been given patentable weight because, although it has been held that a preamble is denied the effect of a limitation where the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. See *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

In this instance, the description in the body of the claim draws life and meaning from the functional limitations in the preamble, but only to the extent that they are required: thus the heating element must be able to function as an actuator of a micropump. But since a micropump and a chamber thereof are not positively claimed, they are not considered essential to the claimed invention, but only are considered to further describe the environment of intended use. Similarly, the limitations of **Claim 2, i.e., for determining a boiling point of a brake fluid of a brake system in a motor vehicle**, further recite limitations on the environment of intended use, not further limiting the structure of the claimed invention.

With respect to **Claim 2**: In this instance, the description in the body of the claim does not draw life and meaning from the functional limitations in the preamble, since the functional limitations in the preamble do not have structural implications. TRAH further

Art Unit: 2859

discloses a device capable of use for determining a boiling point of a brake fluid of a braking system in a motor vehicle, since the inlet and outlet could be directly attached to a brake line in a motor vehicle, if so desired. **TRAH** does not explicitly state this intended use, but no further structural limitation is made by the recitation of Claim 2, so these limitations are not considered to have additional patentable weight.

Regarding the term “micropump”: absent a special definition, the term is considered broadly to require the pump to be small, since no particular length or volume scale is provided, the pump disclosed by **TRAH** is broadly considered small enough to be considered a “micropump” as claimed by Applicant.

**TRAH**, as described above, does not explicitly disclose a current measuring unit as claimed by applicant in **Claim 1**, and the heating element to comprise a PTC resistor element as claimed by Applicant in **Claim 9**, and

the heating element as having been produced from one of aluminum and platinum, and coated with a dielectric as claimed by Applicant in **Claim 8**.

**TURON-LAGOT** discloses a device for determining a boiling point of a fluid including an electrical heating element (resistor 24) situated in the fluid and a chamber; the heating resistor is applied to a substrate (partition 14) which is provided with a cover 18 to form a chamber 20 (e.g., Figs. 2-3) and a current measuring unit 34 (Fig. 1) to infer the instantaneous electrical resistance of the heating element (see Col. 3, Lines 21-24). The sensor 22, having a resistance that varies with temperature, in a second embodiment, as disclosed by **TURON-LAGOT**, is replaced by the single-element heating device 24 (Col. 4, Lines 22-27), being a flat metallic resistor. In this case a sequencer 46 delivers a heating pulse, and the sequencer 46 detects the temperature of the element after the heating pulse.

**TURON-LAGOT** teaches the art-recognized equivalence of using a separate sensor such as a resistor, a thermistor or a thermocouple, or by measuring the resistance of a heating means (resistor) itself when the resistance changes notably nad

has a well known relationship with the temperature (Col. 1, Lines 65 - Col. 2, Line 2; Col. 4, Lines 22-27).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a current measuring unit in combination with a heating/temperature measuring resistor for the heating element as described above for the device of **TRAH** in order to use the heating resistor as a temperature sensor as taught by **TURON-LAGOT**.

Since as described above TRAH requires a means for controlling the temperature of the heating element and TRAH also discloses electrical contacts with the heating elements, it would have been obvious to substitute for the heating element of TRAH a PTC resistor element as claimed by Applicant in **Claim 9** in order to determine when the temperature needs to be changed since the PTC resistor advantageously functions both as a heater and as a temperature sensor as taught by **TURON-LAGOT**.

Regarding **Claim 8**: The materials of the heater are not specified in the applied prior art. **Official Notice** is taken that it would have been obvious to one having ordinary skill in the art at the time the invention was made to produce the heating element from one of aluminum and platinum, since these are well known materials that will heat up when current is passed through them, as required by the heater of **TRAH**, and to coat the heater by a dielectric in order to protect from accidentally short circuiting the device as is very commonly done in the art.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in a form PTO-892 and not mentioned above disclose related measurement devices and micropumps



- U. S. Pat. No. 4,257,775 A (**Ladov et al.**) discloses an ohmmeter for measuring resistance of a temperature probe.
- U. S. Pat. No. 6,308,564 B1 (**Wehrmeyer et al.**) teaches a temperature dependent heating element including voltage-current relationship for determining temperature of brake fluid.
- Frost (U. S. Patent Application Pub. No. US 20050013340 A1) is a distally related boiling point indicator.
- Crivelli (U. S. Pat. No. 6,869,273 B2) is a MEMs device functioning as a pump.
- U. S. Pat. No. 6,787,047 B1 (**Hahn et al.**, in FAMILY of DE 19710358, previously cited by Applicant, and the English Language Abstract of DE 19710358) discloses a microstructured sensor and its use for direct boiling point determination.

**Of the previously cited prior art:**

- US 5330268 A (KLEIN, H C et al.), US 4869596 A (Klein; Hans-Christof et al.) and GB 2197723 (KLEIN, H C et al.): (family discussed in the instant specification) relates to a method and means for determining boiling point of hydraulic fluid, in particular, hygroscopic brake fluid, whose boiling point temperature changes as it unavoidably absorbs water, the boiling point temperature becoming lower as more water is absorbed. Uses a resistive sensor, comprising platinum-and-iridium wire (in 90%:10% ratio), for both heating (in a higher current mode) and temperature determination by measuring the electrical temperature-dependent resistance in a low current mode.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2859

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanley J. Pruchnic, Jr., whose telephone number is **(571) 272-2248**. The examiner can normally be reached on weekdays (Monday through Friday) from 7:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached at **(571) 272-2245**.

The **Official FAX** number for Technology Center 2800 is **(703) 872-9306** for **all official communications**.

Any inquiry of a general nature or relating to the status of this application or proceeding may be directed to the official USPTO website at **<http://www.uspto.gov/>** or you may call the **USPTO Call Center** at **800-786-9199** or 703-308-4357. The Technology Center 2800 Customer Service FAX phone number is (703) 872-9317.

The cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (**[www.uspto.gov](http://www.uspto.gov/)**), from the Office of Public Records and from commercial sources.

Private PAIR provides external customers Internet-based access to patent application status and history information as well as the ability to view the scanned images of each customer's own application file folder(s).

For inquiries relating to Patent e-business products and service applications, you may call the **Patent Electronic Business Center (EBC)** at **703-305-3028** or toll free at **866-217-9197** between the hours of **6 a.m. and midnight Monday through Friday EST**, or by e-mail at: **[ebc@uspto.gov](mailto:ebc@uspto.gov)**. Additional information is available on the Patent EBC Web site at: **<http://www.uspto.gov/ebc/index.html>**.



Stanley J. Pruchnic, Jr.

13 June 2005



GAIL VERBITSKY  
PRIMARY EXAMINER